



# PMS 429 ATD Needs

*PEO(TAD) / PEO SC/AP*

*ATD Industry Day*

31 July 1997



# Background

## *Four Pillars of NSFS*

- Responsiveness
  - F Real Time Surveillance and Targeting
  - F Ten Minute Max—Call for Fire to Weapon Impact
- Flexibility
  - F All Weather, All the Time
  - F All Surface Combatants
- Lethality
  - F Accuracy: 10–20 m CEP
  - F Warhead:
    - à Submunition
    - à Anti-Armor
    - à Deep Penetrator
  - F Volume Fire
- Affordability
  - F \$3K—Low Cost Competent Munition
  - F \$35K—Extended Range Guided Munition
  - F \$500K—Missile

# Top Needs

- Automated Magazine
- Terminal Seeker
- Improved Warheads
- Low Cost Volume Fire
- High Speed, Responsive Round



# Background—*Current Program*

## *In-Development Systems*

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- EX 171 Extended Range Guided Munition

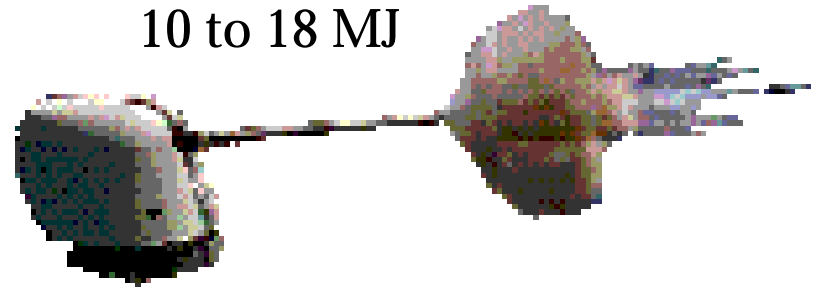
- F GPS Guided

- F Submunition Warhead



- Mk 45 Gun Mod

- F Increase Energy from 10 to 18 MJ



## *Advanced Systems*

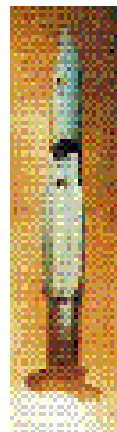
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- Land Attack Missile

- F ATACMS

- F SLAM

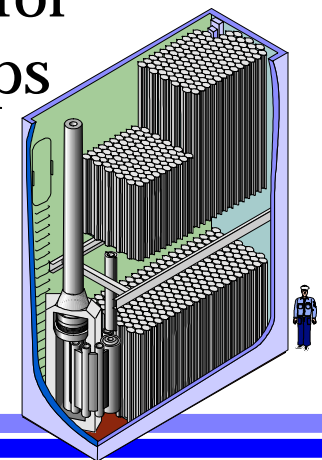
- F Standard



- Vertical Guns for Advanced Ships

- F 155 mm

- F 2 Guns and Magazine in “B” Module



***Naval Surface Fire Support***



# Transition Targets

*A strong transition plan is vital to a successful ATD proposal. Here are some of the transition opportunities in the NSFS program*

- F ERGM Has P<sup>3</sup>I for Terminal Seeker and Unitary Warhead
  - F Warheads, Submunitions and Payloads That Fit in ERGM and Land Attack Missile Are Easily Transitioned.
  - F VGAS Is in Development for SC-21
  - F C<sup>4</sup>I System Begins Development in FY99
- 
- PE 0603795N Gun Weapon System Technology
    - F K2156 Naval Surface Fire Support
    - F S2323 Vertical Gun for Advanced Ships VGAS
    - F S2324 Land Attack Missile
    - F S2325 NSFS System Integration
    - F S2326 Land Attack Warfare Center



# Current ATDs

*(We don't need more of these)*

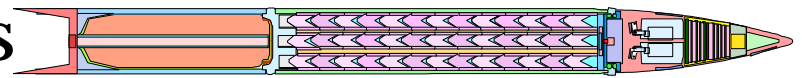
- Competent Munitions

- F GPS/Inertial Navigator

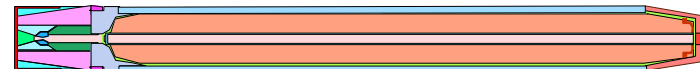


- Best Buy

- F Composite Materials



- F Snap Joint



- Forward Air Support Munition

- F Gun Launched Aircraft

- F Targeting, Bombing



**Naval Surface Fire Support**





# NSFS Program Independent Assessment

MIT Lincoln Lab Recommended Addressing

- + GPS Jamming
- + Surveillance and Targeting Shortfalls
  - . Finding and Locating Targets

- We Need More Ways to Address These Problems
  - F Overcome, Suppress or Kill GPS Jammers
  - F Develop, Receive, Fuse, Register, and Evaluate Surveillance, Targeting, and BDA Data



# Needs Stated in CBD

## ***New Propulsion and Gun Components***

### 7. Land Attack.

- F Alternative gun propulsion methods (such as light gas, traveling charge, or electromagnetic); [or ram accelerator]
- F Advanced propellants; automated magazines; modular caseless charges; modular projectiles; high pressure materials;

- Are There New, Revolutionary Approaches to Guns That Are Ready for Demonstration?





# Land Attack Needs (*cont.*)

## ***Large Guns, Rearming***

### 7. Land Attack. (*cont.*)

- F Components for projectiles fired by larger guns (8-12 inch diameter), particularly for gun-launched aircraft, such as engines, erectable structures for antennas and wings, ordnance dispensers, sensor mounts, sensor windows, and radomes;
- F Technological approaches that support rearming of ships with very small crews, including submarine/surface ship transfers underway;

- Interest in Larger VGAS-Style Guns is Growing

- F Deep Magazines
  - F Low Topside Space Claim
- Compact Weapon Stowage

- What to Shoot?

- How to Rearm?



# Land Attack Needs (cont.)

## ***Guidance and Control Components***

- 7. Land Attack. (cont.)

- F Inertial components (accelerometers and gyros) and supporting electronics to allow projectiles to navigate in the barrel, during the high acceleration of gun launch;
- F W-band, Optical, infrared, laser radar and semiactive laser seekers; automated function; automatic target recognition; modular ship interfaces.

- Ship Defense Against Missiles, Aircraft, Helos, UAVs, Ships, Boats, Coastal Defenses
- Surf Zone Obstacle Clearance
- Inertial-Only or Inertial+Seeker Low-Cost Projectiles
- Seekers Also for Fire Support and Strike Targets



# Land Attack Needs (cont.)

## *Technologies for Flexibility*

- 7. Land Attack. (cont.)

- F Technologies that make guns, projectiles, and their supporting systems more flexible and adaptable, with lower life cycle costs,
  - à Emerging technologies such as micro- and nano-machining, electrorheology and non-Newtonian fluids,
  - à Sensors operating on unusual bands or signatures (multispectral or hyperspectral IR, higher-order signal processing, acoustic/seismic, or interferometric SAR, for example);

- Reduce the Penalty of Gun-Hardening to Cost and Performance

- F Do More Things with Guns and Projectiles

- F Leverage the Deep Magazines, Affordability, and Responsiveness We Have

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# Other CBD Needs

## *Situational Awareness*

### 1. Total Situational Awareness.

- Multi-sensor data correlation; multi-spectral integration; battle management and all source data fusion and targeting.

### ● Applies to NSFS Surveillance, Targeting, BDA

F CEC-Netted

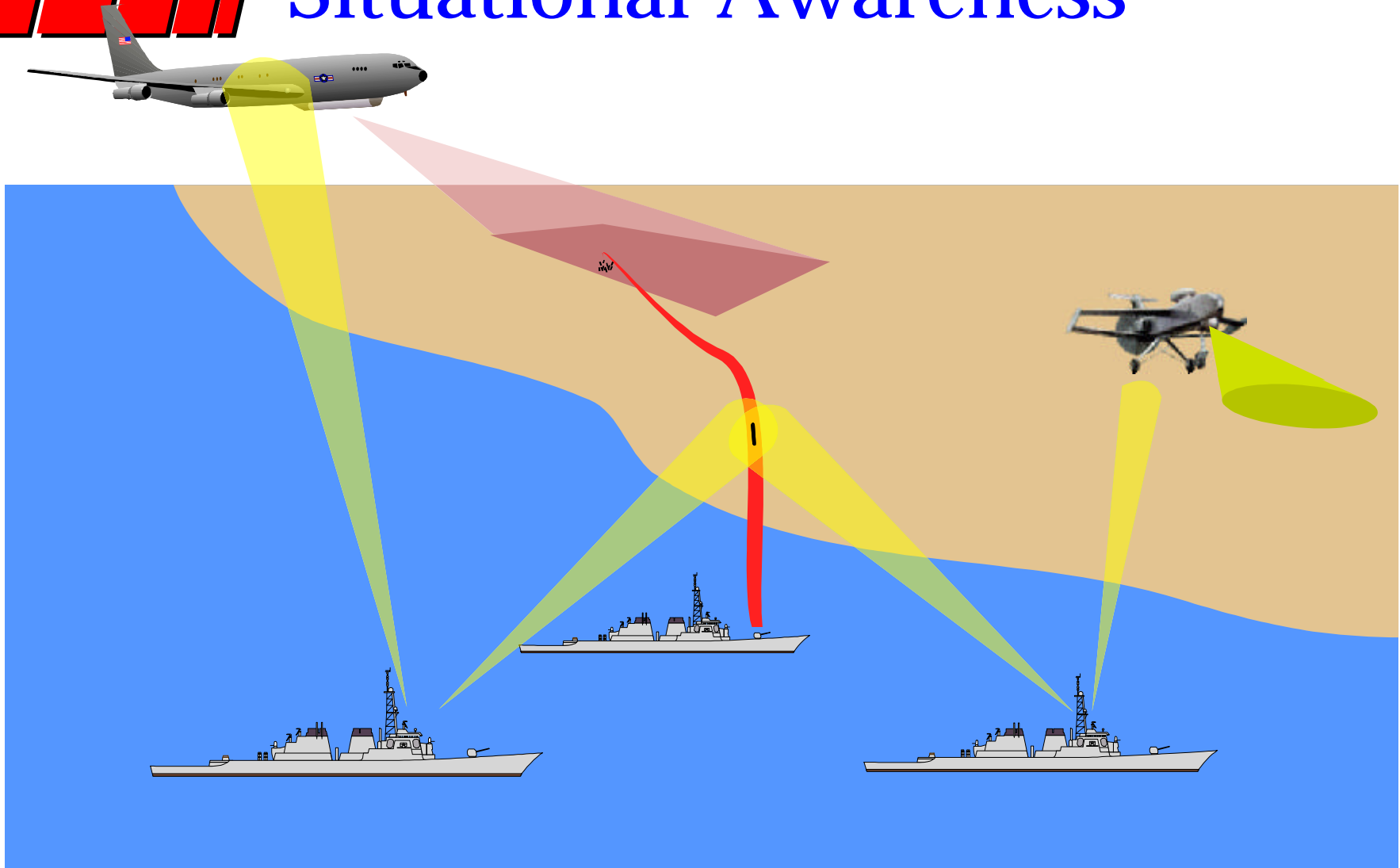
F Correlation and Alignment to GPS

à Supporting Relative, Differential, or Kinematic GPS Accuracy

F UAV, Imagery, SAR, Forward Observers, ELINT, ...



# Situational Awareness



***Naval Surface Fire Support***